# CREMASTERIC CRAMP WITH TESTICULAR RETRACTION

BY

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During the past decade I have dealt with at least half a dozen patients in whom spasmodic cremasteric spasm with testicular retraction has been a distressing disability. In these cases one or both testes have been held temporarily at or near the superficial inguinal ring, causing intense discomfort until relaxation of the cremasteric cramp eventually brought relief. Other surgeons in this country must surely have encountered the condition, but they have either failed to recognize it or have not recorded their observations. From America, McDonald and Mayo (1939) give details of a single case having cremasteric tic with hypertrophy of the cremaster muscle, and Muschat (1941) describes a case of bilateral hypertrophy of the cremaster muscle with spasticity, causing painful contractions. In both instances stress is placed on the finding of marked muscle hypertrophy.

André Thomas (1927) described a case in which there were hyperactive superficial cremasteric reflexes associated with testicular retraction; from the records of the previous eight years he was able to find one other comparable case. Both patients were near 40 years of age, in both the hyperactive left cremasteric reflex produced testicular retraction with cramp-like pain, and in both no evidence of organic disease could be found. The spasms continued to trouble these patients for some years, one eventually managing to live with his complaint with lessened worry, and the other developing nervous depression. Thomas concluded his paper by observing that the physiological pathology of testicular retraction is enveloped in great obscurity. The syndrome now reported would appear to be akin to that originally described by André Thomas.

When I first encountered a case of cremasteric cramp with testicular retraction, it was regarded as a psychological rather than a surgical problem, and it was with some hesitancy that an attempt was made to help the patient by operation.

### Case 1

A vicar aged 40 initially experienced spasmodic testicular retraction following a day's hunting several months prior to his attendance at hospital in 1946. The attacks had become more frequent and severe; at first a strain or twist might precipitate an attack, but, latterly, emotional disturbance was sufficient, and invariably a spasm developed when he entered the pulpit to give a sermon. Various sedatives had been tried unsuccessfully and the patient was becoming so miserable that he was willing for any procedure to rid him of the complaint.

Examination revealed no abnormality apart from a hyperactive right cremasteric reflex. With the slightest stimulation of the medial aspect of the thigh, the testis was drawn up to the external ring, but the retraction was of short duration and there was no associated cramp-like pain, which was the main cause of his distress. Sedatives were again tried along with "procto-caine" infiltration into the cord. No benefit resulted, and reference to the psychiatrist was being considered. Before this could be arranged the patient was sent back with a particularly severe attack and it was agreed to try to give relief by operation.

At operation a wide external ring was noted, but there was no evidence of hernia; a well-developed cremaster muscle and the ilio-inguinal nerve were excised. The patient was completely relieved of his troublesome complaint by the operative procedure and there has since been no further trouble.

After a lapse of several years another example presented itself. There was not the slightest suggestion of any nervous instability and, bearing in mind the first most satisfactory result, operation was undertaken with much less hesitation.

### Case 2

A farm-worker aged 26 was referred in 1952 as his doctor thought the condition was a right inguinal hernia. For several years the patient had had attacks of pain in the right groin, and he noticed that with them there was an associated drawing up of the testis. During the previous four months the attacks had become more frequent and similar symptoms were appearing on the left side. An attack would be precipitated by heavy lifting, and, before gradually easing, it might persist for 24 hours. On occasions the pain was severe enough to make him feel faint, and not infrequently nausea was experienced. Three years previously appendicectomy had been performed for a gangrenous appendix; before the operation the attacks had been so mild that he had not mentioned them, but after leaving hospital their frequency and severity increased.

The patient had moderate muscular development, and general examination revealed no abnormality. The appendix scar was firm and not tender. Both testes lay in the scrotum, the right a little higher than the left. Cremasteric reflexes were brisk on each side, but no testicular displacement was maintained. The external rings were wider than normal; there was no evidence of hernia.

At operation bilateral unopened indirect hernial sacs were isolated and removed. The ilio-inguinal nerves and well-developed cremasteric muscles were excised. The patient had an uneventful post-operative course, and a year later reported that he had remained free from any symptoms.

The following case was at first not recognized. Cremasteric cramp is not given amongst the causes of haemospermia, but in this instance there is little doubt that the testicle became impacted at the external inguinal ring and the resulting trauma led to the appearance of blood in the semen.

### Case 3

A radio mechanic aged 26 was referred for investigation of haemospermia in 1952. On three occasions during the previous month he had noticed that his semen was blood-stained. At this time his only other complaint was of some aching in the right testis. Examination revealed no abnormality, and in due course in-patient investigation was carried out. Intravenous pyelogram, urethroscopy, cystoscopy, and retrograde pyelogram were all negative. No abnormal constituents were found in the semen or urine, and guinea-pig inoculation did not produce tuberculosis. In view of the negative findings the patient was reassured and discharged. Four months later he returned, giving the history that a week previously, during intercourse, he had developed severe cramp-like pain in the right groin. The testis had been drawn up out of the scrotum and remained displaced for 20 minutes; again haemospermia had been noted. On further questioning the patient admitted that with the previous haemospermia the testis had been drawn up to the groin and afterwards had felt tender and swollen.

At operation the ilio-inguinal nerve and a normal-looking cremaster muscle were removed. No hernial sac was present. Post-operatively, a scrotal haematoma developed and gradually resolved. A year later the patient was complaining of some ache in both testes, but there had been no further retraction or haemospermia. Apart from a little thickening round the right testis, which was rather higher in the scrotum than the left, no abnormality could be found. After a further year the peritesticular thickening had disappeared, but the testis still remained at the higher level. The patient was completely free from any symptoms.

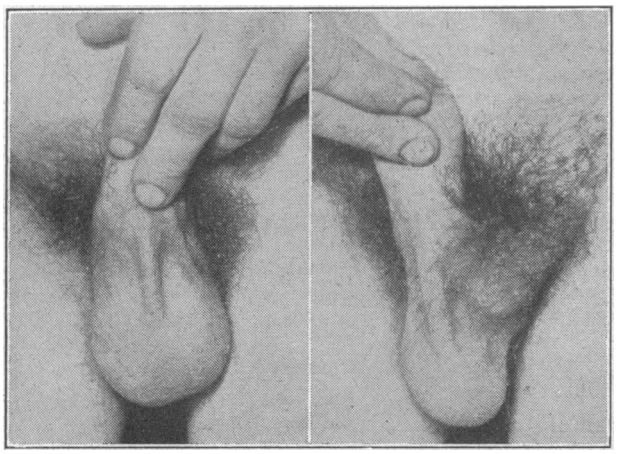
In the next case, as well as in others, the practitioner referring the patient diagnosed inguinal hernia and failed to realize that the inguinal swelling was in fact the testis displaced by cremasteric cramp.

### Case 4

A farm-worker aged 27 was referred in 1954 with his doctor's letter, which stated: "This man has a right inguinal hernia. He cannot always demonstrate it well by coughing, but I have seen an obvious lump in the lower end of the inguinal canal. Would you advise re operation?" The history dated back some two years. After a heavy day's work carrying timber, the patient had retired early; during the night he was awakened by severe pain in the left groin which persisted for several hours. The attack did not prevent him working next morning, but for several days he avoided anything strenuous. There was freedom from any further complaint for 18 months, and then he began to have attacks of

pain in the left groin after heavy lifting. One evening after a particularly hard day when he had been carrying 1¼-cwt. (76-kg.) sacks of corn, he suddenly developed a swelling in the right groin, and the accompanying severe pain caused him to roll about in agony; this had eased by the time his doctor arrived. Thereafter, attacks of pain on one or the other side might develop every few weeks. Invariably, prior to an attack he had done a heavy day's work; ordinary exercise never seemed to precipitate an attack, but milder bouts might follow an attack of coughing.

The patient was a placid type, well built and muscular. General examination was negative. Both external rings were widened to admit a thumb, but there was no evidence of hernia. The cremasteric reflexes were hyperactive. On the left side, after coughing, the testis became drawn up to the external ring, where



Case 4. Left: Both testes in the normal position immediately before coughing. Right: After coughing; cremasteric spasm maintaining displacement of left testis.

it remained until gentle traction returned it to the normal position (see Fig.). At the time of examination the updrawn testis produced no pain, but during an attack the patient stated that the testis seemed to be firmly jammed in the groin and then he experienced intense pain.

At operation no hernial sacs were found. The ilio-inguinal nerves and normal-looking cremasteric muscles were excised. The post-operative course was uneventful, and 18 months later the patient reported freedom from complaint and ability to lift heavy weights without fear.

While several of the patients have vaguely attributed the onset of the condition to some trauma, the next patient was quite definite that the first attack developed with a strain at work, and there is no reason why his statement should be doubted. It is interesting to note that Winsbury-White (1948), on the subject of displaced testis, cites the case of a youth of 19 who strained himself on lifting and displaced his left testis into the inguinal region, where it was found at operation a year later. The explanation offered was that sudden strain caused excessive contraction of the abdominal muscles associated with overaction of the cremaster, the latter drawing the testis up into the inguinal canal, to remain exactly like a typical imperfectly descended testis. In the present series no external ring has been wide enough to permit the testis actually to enter the inguinal canal, but there is no doubt that in some instances partial entry or impaction at the external ring has taken place.

### Case 5

A decorator (formerly an Army P.T. instructor for six years) aged 42 was referred in 1955 for treatment of right inguinal hernia. He gave the history that four or five months previously while stretching at his work he experienced a sharp pain in the right groin. A swelling was noticed in the groin, and after pressure with the hand both swelling and pain disappeared. Since then the symptoms have recurred several times during an evening and sometimes while at work. Cramp-like pain in the groin has always been associated with the appearance of the swelling, and it has been ten minutes before the attack subsided. He found that an attack was more readily precipitated by crossing the right leg over the left when in a sitting position; any undue stretching of the trunk might also bring on a spasm. Exercise, weight-lifting, and intercourse never produced an attack. Apart from the foregoing, he had no other complaints, but the increasing frequency of the attacks was beginning to make his life miserable.

On examination the patient was noted to be of spare build. No abnormality could be found in the lungs, heart, or abdomen. Abdominal, patellar, ankle, and plantar reflexes were equal and normal. The prostate was elastic and a little enlarged; the vesicles were not palpable. The external genitalia were normal and the hernial areas were intact. On stroking the medial aspect of either thigh, a brisk cremasteric response was noted. When the patient coughed, the right testis left the scrotum and appeared as a painless swelling at the external ring. Replacement was readily obtained by digital pressure, but during the actual attacks massage might be required for some minutes before the intense groin cramp abated and the testis could be eased back into its proper position.

At operation no hernial sac was present, but the external ring was wider than normal. A well-developed cremasteric muscle and the ilio-inguinal nerve were excised.

Apart from mild bronchitis, the post-operative course was uneventful. When seen as an out-patient six weeks later he was most grateful that his symptom had been completely relieved. He stated that since the condition first developed while twisting at work, he intended making a claim for compensation.

The most recent case, the second in 1955, was found within a couple of months of the previous one. A patient with bladder papilloma had received proper attention at the hospital he first attended. His haematuria, however, had caused him much less concern than his intense spasms of groin pain, which persisted unrelieved by antispasmodics. It was only on direct questioning that he described an associated testicular retraction; previously he had never thought of mentioning this symptom. There must be a number of such cases in which the true diagnosis remains obscure because the patient fails to mention the disappearance of the testis from the scrotum.

### Case 6

A herdsman aged 35, the father of four children, first had haematuria in 1952, and cystoscopy had revealed a bladder papilloma which was fulgurated. After he moved into this area, a further bleeding led to his reference to hospital and a recurrence above the right ureteric opening was destroyed. At the time of his admission for this cystoscopy he was complaining bitterly of spasms of pain in the left groin. This symptom had gradually developed over the past three years. Initially the painful attacks occurred every few weeks; he knew of nothing special that precipitated an attack, which usually came on as he was walking. Relief came after several hours' rest. Nausea was associated with the pain, which seemed to extend upwards into the left iliac fossa. With the attacks, he admitted that the left testis was always drawn up into the groin, where it remained until the attack subsided. During the previous few months the right side had been affected in a similar manner. The bilateral spasms became more frequent and distressing; he found it difficult to carry on with his work, and intercourse was impossible because each attempt would bring on painful spasms. His previous health had been good apart from a severely lacerated elbow in 1952; it was soon after this accident that he experienced his first spasm.

A general examination revealed no abnormality. Neither cremasteric reflex was unduly active, but the scrotum possessed an unusually tonic dartos muscle, which held the testes at a higher level than normal. Both testes could readily be displaced from the scrotum to lie subcutaneously in the inguinal regions. This displacement was associated with some discomfort, but the type of severe nauseating pain experienced in the attacks was not reproduced.

At operation it was found that both testes when displaced lay in the subcutaneous tissues overlying the medial part of the inguinal canal. Neither external ring was widened, and cremasteric hypertrophy was absent. The ilio-inguinal nerves were excised along with the cremasteric muscles. On the right side there was a weakness of the posterior wall of the inguinal canal; no indirect hernial sacs were present. Bilateral repair was carried out.

Immediately after operation the right testis tended to displace upwards owing to dartos contraction, but a firm-pressure dressing discouraged this. Post-operatively there was some haematoma formation in the scrotum, but spontaneous resolution occurred, leaving both testes in the scrotum. When the patient attended

hospital a month later it was noted that weight had been gained. The loss of his symptoms had changed him from a very miserable to a most cheery individual.

### Comment

The cremaster muscle, which plays the active part in the syndrome, originates from the lower fibres of the internal oblique and transversus abdominis muscles. It forms an investment for the spermatic funiculus deep to the external spermatic fascia, and descends as a series of loops over the cord and testis; medially the fibres ascend to have insertion into the pubic tubercle. The nerve supply comes from L 1 and 2 through the external spermatic branch of the genito-femoral nerve; arising from the same lumbar segment is the ilio-inguinal nerve, the terminal cutaneous branches of which innervate the skin of the thigh over the proximal and medial part of the femoral triangle.

The function of the cremasteric reflex is protective. In the small boy it is well known that from this hyperactive reflex on little provocation, the testes may temporarily disappear up into the inguinal canal or even into the abdominal cavity. As a protection from undue variations in temperature, which might prove harmful to the testis, the cremaster muscle is said to make appropriate adjustments. Whether this be true or not, it is perhaps significant that in natives of hot climates the cremasteric fascia is represented by no more than a few slender fibres hardly recognizable as muscle.

Reflex or defence movements in which there are sudden twitch-like co-ordinated involuntary movements are classified as tics. In the case described by McDonald and Mayo (1939) the cremasteric hypertrophy was associated with regular twitching and could truly be termed a tic. With the present series of cases the tonic rather than clonic nature of the spasms suggests that the malady is more allied to that group of disorders known as the cramps.

Cremasteric cramp with testicular retraction must be produced by some factor exciting the reflex either from the central nervous system or from within the arc itself. Spasms of the cremaster muscle have been reported in patients with central brain or spinal injuries; Hamburger is quoted as describing several cases of hyperactive cremasteric reflexes with spasm in which he thought the cause was psychogenic. Organic lesions of the central nervous system can be excluded as a possible cause in the above cases, and perhaps one of the half-dozen patients could be regarded as having any psychogenic instability. The remainder were hard-working men in whom the cause seems to lie within the reflex arc itself. Some local trauma has been the usual exciting factor; thereafter, the cremasteric reflex has become hypersensitive, and not infrequently the affliction has spread to involve both sides.

The fact that six cases have been personally dealt with by one surgeon supports the suggestion that the condition is a definite clinical entity which cannot be so very rare. A number of patients with undiagnosed groin pain might well belong to this category if its possibility were considered and the patient asked directly whether his testis was drawn up during the attacks. It is worthy of note that patients who have experienced the condition for any length of time develop anxiety not only from the continued discomfort but also from their inability to continue working because of it. The post-operative patient presents a marked contrast to the troubled individual he was before the operation.

The salient features of the syndrome may be summarized as follows: (1) the average age of onset was 32; (2) some form of local trauma usually precipitates the first attack, but thereafter lesser stimuli can initiate attacks; (3) once started, the condition is progressive and may eventually become bilateral; (4) hyperactive cremasteric reflexes may be elicited; (5) cremasteric cramp draws up the testis to near the external ring and intense groin discomfort is experienced until relaxation of the tonic spasm occurs; and (6) actual muscle hypertrophy is not always present, but it is likely to develop in the cases of longer duration.

### Treatment

Drug therapy combined with psychotherapy, excision of the ilio-inguinal nerves, injection of an oestrogen, hot sitz baths, and diathermy have all been advocated by various authors. The results have been variable and uncertain. In both the cases reported in America (McDonald and Mayo, 1939; Muschat, 1941) removal of the hypertrophied cremaster muscle was completely effective, and similar treatment given to the above six cases was equally satisfactory.

Approach is made through an incision over the inguinal canal, which is opened from the external ring. The ilio-inguinal nerve is first removed. At the abdominal ring, a cuff of cremaster muscle is turned off the internal oblique and stripped down as far as the testis, removal of muscle being completed at this point. Any hernial sac is then excised. The mobilized conjoint tendon is sutured to the inguinal ligament deep to the cord with interrupted fine thread. The external oblique is then closed behind the cord medially.

The operation tackles the syndrome from three aspects: removal of the ilio-inguinal nerve renders anaesthetic the chief cutaneous trigger area for the cremasteric reflex; excision of the cremaster muscles leaves no muscle to develop cramp or draw up the testis; and, after the local readjustment, the external ring is no longer available for testicular impaction.

### Summary

Six cases of cremasteric cramp with testicular retraction are described.

It is considered that the disorder, if it were recognized, would be found perhaps not so uncommon as the literature would suggest.

A minor operation is effective in giving complete relief.

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# CLINICAL DIAGNOSIS OF PYLORIC OBSTRUCTION

## THE SODA-WATER TEST

BY

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The clinical diagnosis of pyloric obstruction is not always easy. Early cases often present without copious and frequent vomiting. There is not much doubt if visible gastric peristalsis is present on examination, but this is rather infrequent (Parsons and Watkinson, 1954). Succussion splash is of doubtful diagnostic value. Most textbooks mention some adjuncts to simple inspection, including massage of the abdomen (Hurst, 1946) and tapping the stomach area with the fingers to stimulate peristalsis (Bockus, 1944). Bockus also states that visible gastric peristalsis is seen in only about 50% of the cases of pyloric obstruction and has to be carefully sought. For many years some physicians and surgeons have given a drink of water in the suspected case to stimulate peristalsis, because when the patient is examined his stomach is often empty or atonically dilated and inactive. Osler and Macrae (1920) recommended a dose of tartaric acid